Canon

BCTV Zoom Lens
广播电视变焦镜头
HDXS LENSES

HJ14ex4.3B
HJ17ex6.2B
HJ17ex7.6B
HJ18ex28B
HJ21ex7.5B
HJ22ex7.6B

取扱説明書　（レンズ編）

OPERATION MANUAL (LENS)

使用说明书　（镜头汇编）

ご使用の前に必ずこの取扱説明書をお読みください。
なお、取扱説明書は必要に応じてご覧になれるよう大切に保管してください。

Read this operation manual before using the product.
Keep the manual in place for future reference.

在使用本产品之前，请务必先仔细阅读本使用说明书。请务必妥善保管好本书，
以便日后能随时查阅。请在充分理解内容的基础上，正确使用。

J/E/C

ENGLISH VERSION

FCC REGULATIONS

This device complies with Part 15B of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15B of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Do not make any changes or modifications to the equipment unless otherwise specified in the manual. If such changes or modifications should be made, you could be required to stop operation of the equipment.

Canadian Radio Interference Regulations

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

CE

We, Canon Inc., in Japan and CANON EUROPE LTD., in U.K., confirm that the BCTV zoom lens is conformity with the essential requirements of EC Directive(s) by applying the following standards:
EN55103-1 and EN55103-2

Note:
a) Applicable Electromagnetic Environments:
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).
b) Use of shielded cable is required to comply with limits specified by above standards.

Dieses Produkt ist zum Gebrauch im Wohnbereich, Geschäfts- und Gewerbebereich sowie in Kleinbetrieben vorgesehen.

European Union (and EEA) only.

This symbol indicates that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to a designated collection point, e.g., on an authorized one-for-one basis when you buy a new similar product or to an authorized collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, approved WEEE scheme or your household waste disposal service.
Your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources and will avoid incurring administrative sanctions according to art. 50 and following of Italian legislative decree 22/97.
For more information regarding return and recycling of WEEE products, please visit
www.canon-europe.com/environment.
(EEA: Norway, Iceland and Liechtenstein)

— FOREWORD —

Thank you for purchasing the Canon BCTV zoom lens.
This product comes with the following documents for the models mentioned below:

①Operation Manual "Lens"
②Operation Manual "Information Display CD-ROM"
③Pocket Guide

HDxs LENSES

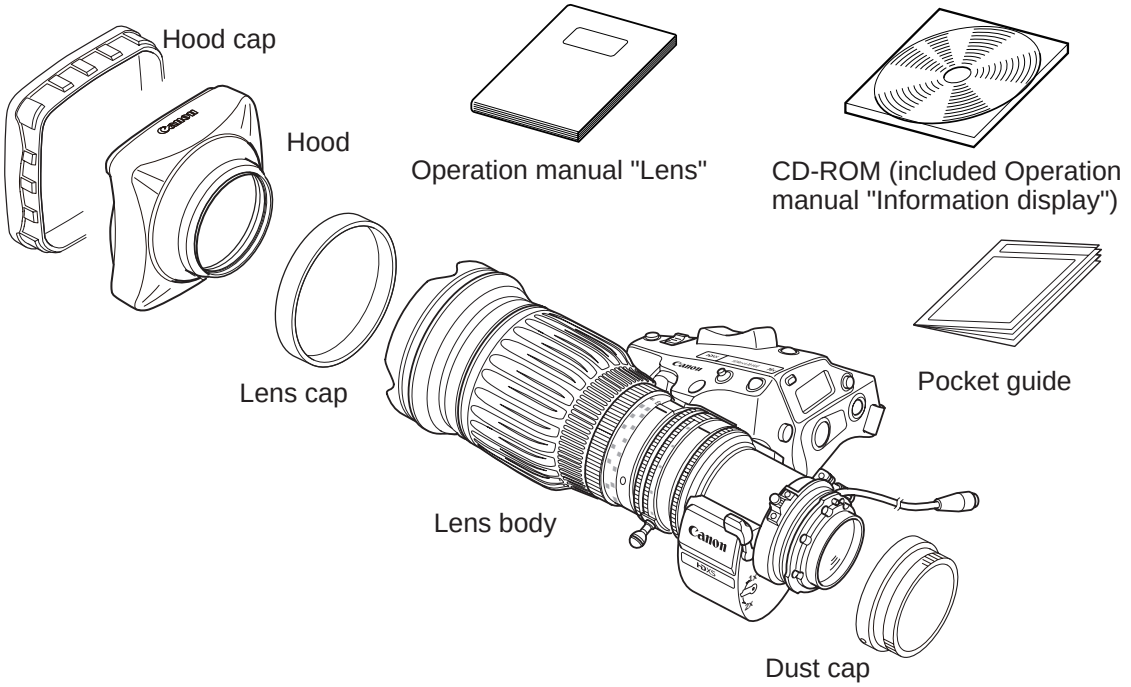
HJ14ex4.3B HJ17ex6.2B	IRSE
	IASE
	IRSE-C
	IASE-C

HJ17ex7.6B HJ18ex28B HJ21ex7.5B HJ22ex7.6B	IRSE A
	IASE A
	IRSE-C A
	IASE-C A

The illustrations in this book show HJ14ex4.3B IASE unless otherwise specified. Actual forms may vary depending on models and specifications.

STANDARD PRODUCT LIST

Make sure all of the following items are included in the packing box. If you find any item missing, please contact your dealer or Canon Inc.



Accessories other than those mentioned above may be required depending on the specifications of your unit.
For details, contact your dealer or Canon Inc.

GENERAL SAFETY INFORMATION

The safety warnings and cautions provided on the product or in this operation manual must be observed. Failure to observe these warnings and cautions provided to guard against hazards may result in injury or accident.
Read this operation manual carefully to familiarize yourself with its contents and ensure that you can operate the product properly.
Also, store this manual in a safe place where it can easily be referenced whenever required.
This operation manual uses the following symbols and terms to identify hazards to protect you and others by aiming to prevent the occurrence of accidents.

⚠ WARNING	This indicates a potentially hazardous situation which, if not heeded, may result in death or serious injury to you or others. Be sure to heed all warning notices to ensure safe operation at all times.
⚠ CAUTION	Indicates hazardous situations which, if not heeded, may result in minor or moderate injury to you or other persons, or damages to your property.
NOTE	Emphasizes essential information which, if not heeded, may render the product unworkable or cause it to function improperly. Also, provides helpful information for operation.

HANDLING THE PRODUCT

⚠ WARNING

1. Never allow water to enter or be spilled on the product.
   Immediately stop using the product if water enters the product. Otherwise, a fire or electric shock hazard may result.
2. Do not stare at the sun or other source of high-intensity light through the lens. Doing so may result in injury to your eyes.

⚠ CAUTION

1. Do not drop the lens when transporting it or when attaching or detaching it to or from the camera head. The lens may fall, possibly causing injury.
2. Make sure all mountings are tightened securely. If any of these mountings becomes loose, the lens may fall, possibly causing injury.
3. Always grasp the connector itself when connecting or disconnecting the lens cable. Pulling on the cable portion may result in damage to the cable, such as breakage of the conductors. Power leaking from a damaged cable may present a fire or electric shock hazard.
4. Inspect all mountings periodically (about every 6 months to year) to make sure they are securely tightened, and tighten any loose portions. Otherwise, the lens may fall, possibly causing injury.
5. If it becomes necessary to repair this product, or to perform any operations or adjustments not mentioned in this operation manual, contact Canon's representative or the dealer who originally supplied the lens.

NOTE

1. Protect the lens from strong impacts of shocks. Striking or dropping the lens may result in a malfunction.
2. This lens is not completely waterproof, so avoid exposing it directly to rain or snow. When the lens must be used in rain or snow, provisions should be made to prevent the lens from getting wet.
3. Under dusty conditions, the lens should be mounted or dismounted with a cover placed over the mount so as to prevent dust from entering into the interior.
4. Do not bring the lens, kept in a very cold ambient temperature, into a warm room, because the lens may fog on the inside or condensation may occur.
   In these cases, the lens cannot be used until these problems clear.
   If the lens must be used under such conditions, countermeasures are recommended. (For instance, before bringing the lens into a warm room, put it in a vinyl bag with an effective desiccant, and then bring it into the room. After the temperature acclimatizes to the same level as the room temperature, take out the lens out of the vinyl bag.)
5. If the lens is to be used in adverse environments, such as in a chemical laden atmosphere, consult with Canon's representative beforehand.

DEALING WITH ABNORMALITIES

⚠ WARNING

1. Should any of the abnormalities described below occur, immediately unplug the lens cable from the camera, and then contact Canon's representative or the dealer from whom you purchased the lens.
   • Smoke, abnormal smell, or abnormal noise.
   • Entry of foreign objects (including metals and liquids) inside the lens.

MAINTENANCE AND INSPECTION

⚠ WARNING

1. Unplug the lens cable and remove the lens from the camera, before attempting to clean the lens. Never use flammable substances such as benzene or thinner for cleaning, as this may present a serious fire or electric shock hazard.

NOTE

1. Dust or fingerprints on the lens surface. Gently blow or brush away dust or dirt on the lens surface using a lens blower or a soft lens brush. Remove any fingerprints or other stains with a clean cotton cloth moistened with commercially available lens cleaning fluid or lens cleaning paper.
   Gently swirl the cloth or cleaning paper over the lens surface, starting at the center area of the lens, and then circling gradually outward until whole lens surface has been covered.
   Be careful not to rub dust across the lens, as the lens surface may be scratched.
2. Periodic inspection
   A periodic inspection about once a year is recommended.
   The inspection and maintenance interval depends on the operating conditions, the frequency of use, and the environment. If required, overhaul the lens.

STORAGE

⚠ CAUTION

1. Always attach the lens cap (or hood cap) and the dust cap before storing the lens. Storing the lens without these caps attached may present a fire hazard. (Very bright light, such as sunlight, may be focused by the lens and cause a fire.)

NOTE

1. Moisture inside the lens
   If the lens becomes damp because of use in fog, mist or drizzle, wipe off the moisture with a soft dry cloth and seal the lens together with an efficient desiccant in a vinyl bag to remove moisture which has entered into the interior.

TO THE CUSTOMER

1. Canon shall bear no responsibility for damage resulting from improper operation of this product by the customer.
2. Canon shall make no guarantees about the product quality, functions, or operation manual and its marketability and suitability for the customer's purpose.
   Moreover, Canon shall bear no responsibility for any damage, direct or incidental, that results from usage for the customer's purpose.
3. Canon shall make no guarantees about the results obtained using this product.
4. The product specifications, configuration, and appearance are subject to change without prior notice.
5. For further information on repairs, maintenance, or adjustments not mentioned in this operation manual, contact your Canon dealer or your Canon sales representative.
6. Note that Canon may be unable to undertake servicing or repair of a product if it is modified without consulting Canon or your Canon sales representative.

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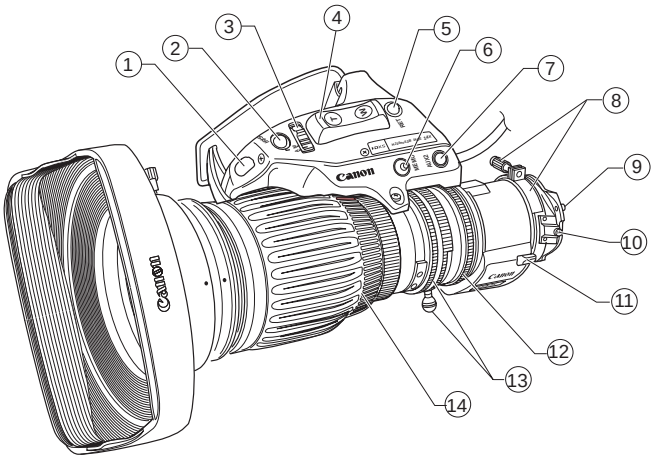
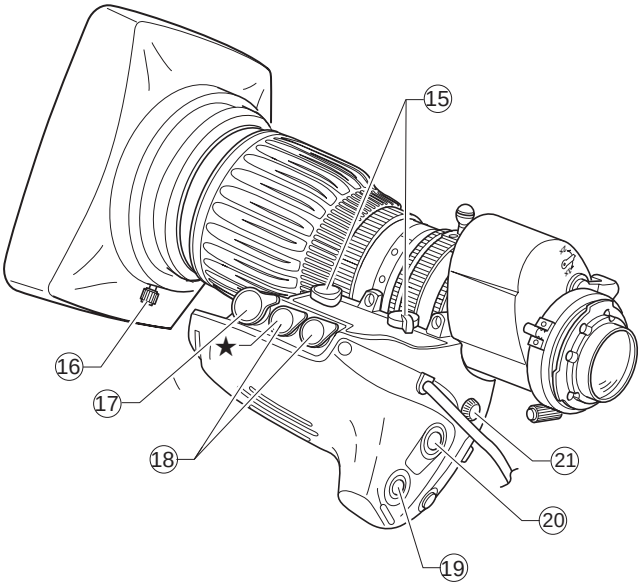
1 NOMENCLATURE





① Iris Gain Adjusting Trimmer

② Instant Auto-Iris Switch

③ Iris Operation Mode Change-over Switch

④ Zoom Rocker Seesaw

⑤ RET Switch (Video Return Switch)

⑥ Memo Button (Memory Button)

⑦ AUX2 (refer to page E13)

⑧ Flange Back Lock Screw/Flange Back Adjusting Ring

⑨ Locating Pin

⑩ Macro Button/Macro Ring

⑪ Extender Lever

⑫ Iris Ring

⑬ Zoom Lever/Zoom Ring

⑭ Focus Ring

⑮ Zoom Focus Operation Change-over Knob

⑯ Hood Lock Knob

⑰ Connector for Remote Zoom Control (8-pin)

⑱ AUX1 (refer to page E13)

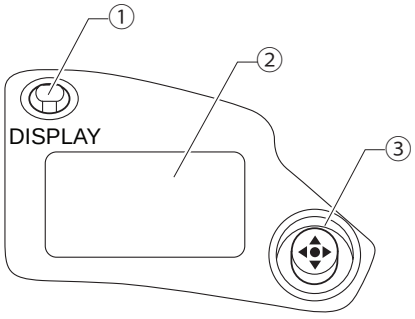
⑲ Virtual & Zoom Remote/Focus Remote Connectors (20-pin)

NOTE) Virtual output port is Connector ★ only.
Use these connectors to connect the control accessory (equipped with a 20 pin connector) for zooming or focusing. Connector ★ is also used to connect to the interface of such as virtual system. It can output each positioning signal of zoom, focus, and iris.

⑳ VTR Switch

㉑ Max. Zoom Speed Volume

Information Display (Digital Drive Unit)



① Display Switch

Used to turn the display ON/OFF.

② Display

It turns off if left for 2 minutes without operation.

③ Control key

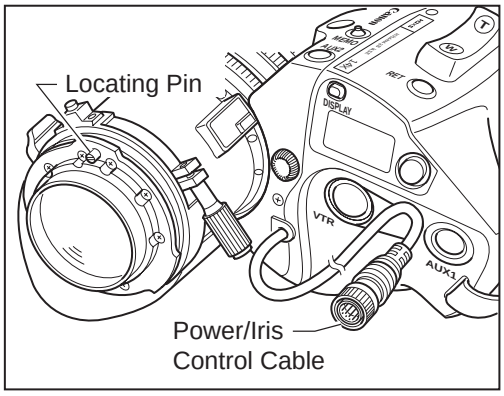
Used to move the cursor up/down/left/right. Press the center to confirm.

For the operation of the digital drive unit, refer to the Information Display Manual on the CD-ROM or the Pocket Guide.

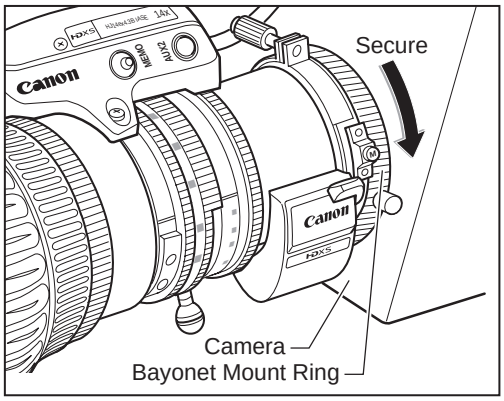
2 HOW TO MOUNT

2-1. MOUNT THE LENS ON THE CAMERA

Before mounting the lens on the camera,make sure that the camera's power is turned off.



1. Remove the dust cap from the lens.
2. Align the lens locating pin to the groove on the camera mount to fit the lens to the camera mount.
3. Turn the bayonet mount ring on the camera to secure the lens.
4. Connect the power/iris control cable of the lens to the camera.

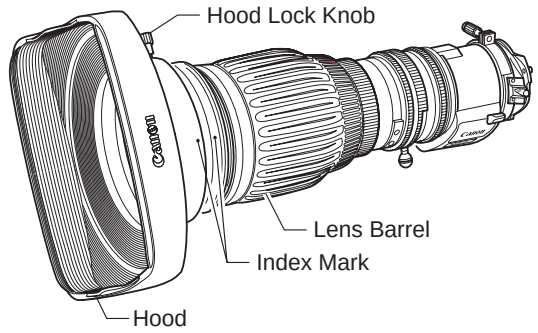


⚠ CAUTION

Never hold the lens, drive unit and band portion to support the entire weight of the camera. Excessive force to the mount portion and drive unit of the lens may result in damage to the lens mechanism.

2-2. MOUNT THE HOOD ON THE LENS

The lens cap is attached to the lens at the factory. Please remove the lens cap and attach the hood as instructed below.



1. Fit the hood on the front of the lens barrel.
2. Align the index marks on the hood and lens barrel.
3. Tighten the hood lock knob.

2-3. TURN IT ON

Turn on the camera,and the power of the lens will be supplied.

2-4. INITIALIZE THE LENS

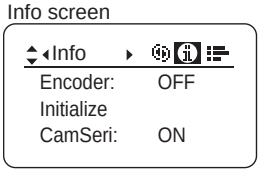
This lens has a built-in encoder for a position sensor of zoom, iris and focus, and enables high-accuracy control and advanced for virtual interface. To use these functions, the initialization of encoder is required when the power is turned on.

The Auto [on] / Manual [off] setting of initialization can be set from the information display.

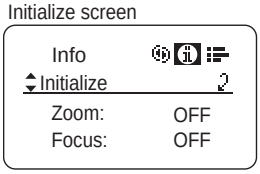
Auto [ON] : The lens is automatically initialized on power-up. (When in servo mode)
Manual [OFF] : Move to both mechanical ends by servo operation or by manually turning the rings, to detect positions on power-up.

* Default setting at factory : OFF

Info screen



Initialize screen



1. Press the DISPLAY switch to turn on the display.
2. Press the Set key and move the left or right key to display the Info screen. (See left top figure.)
3. Press the down key twice, and then press the Set key.The display is switched to the Initialize screen. (See left bottom figure.)
4. Select [Zoom] or [Focus] using the down key.
5. Select {ON} or {OFF} using the left or right key.
6. For the changes in the settings to take effect, turn the power off and then turn it back on.

How to detect the position of ZOOM

Servo / manual switch setting	Drive unit initialize operation	How to detect the position
Servo	ON (Auto)	When the power is turned on, the lens automatically detects the position. Then, it returns to the position where it used to be when the power was turned on.
	OFF (Manual)	Perform servo zooming operation to the both mechanical ends to detect positions.
Manual	ON or OFF	Turn the zoom ring manually to both mechanical ends to detect positions.

How to detect the position of FOCUS

Servo / manual switch setting	Drive unit initialize operation	Demand	How to detect the position
Servo	ON (Auto)	Connected	When the power is turned on, the lens automatically detects the position. Then, it returns to the position instructed bycommand from the demand.
		Not connected	When the power is turned on, the lens automatically detects the position. Then, it returns to the position where it used to be when the power was turned on.
	OFF (Manual)	Connected	When the power is turned on, the lens automatically detects the position. Then, it returns to the position instructed bycommand from the demand.
		Not connected	The lens does not automatically detect the position when the demand is not connected. When the demand is connected, the lens automatically detects the position. Then, it returns to the position instructed by command from the demand.
Manual	ON or OFF	Whichever	Turn the focus ring manually to both mechanical ends to detect positions.

When position detection is failed:

- The position signal sent from the lens to the camera and its indication on the information display will be incorrect.
- Shuttle Shot, Frame Preset, Speed Preset and Zoom Track functions will be disabled.

Notes

- Iris is always initialized when powered on regardless of auto mode or manual mode.
- During initialization, lens operation is disabled. After initialization is completed, the lens returns to the position where it used to be before initialization. However, if the lens is operated in the position servo mode, the lens moves to the currently controlled position.
- When the mode is switched from manual to servo after powered on with the initialization operation enabled, the position detection will automatically start if initialization is not completed.
- The initialization operation can be enabled/disabled on the information display. When any initialization operation is changed, turn off then on the power for the changes to take effect.

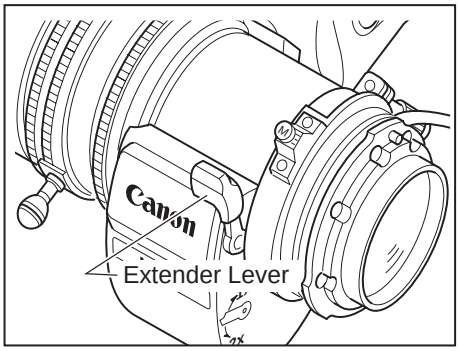
Initialize Error! message

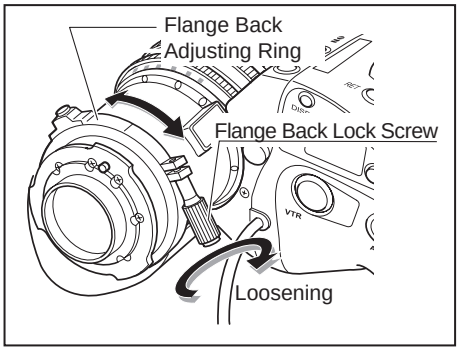
"Initialize Error! message" appears when the servo/manual switch is not fully switched to the servo mode side or the lens is forcibly locked. In such case, check the lens condition, clear the problem, and then turn off and on the power again.

3 ADJUSTMENT

3-1. BACK FOCUS ADJUSTMENT OF THE LENS

If the relationship between the image plane of the lens and the image plane of the television camera is incorrect, the object goes out of focus when the lens is zoomed. Follow the procedure below to adjust the back focus of the lens.

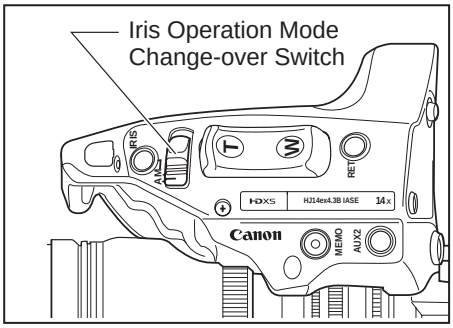


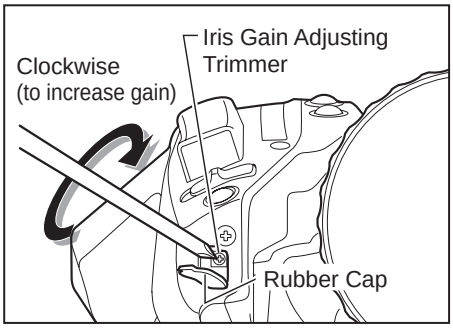


1. Select an object at an appropriate distance (HJ14ex: 1 to 3m, HJ17ex / HJ21ex / HJ22ex : 2 to 5m, HJ18ex : 5 to 7m recommended). Use any object with sharp contrast to facilitate the adjustment work.
2. Set the extender lever to 1x.
3. Set the iris fully open.
4. Set the lens to the telephoto angle by turning the zoom ring.
5. Bring the object into focus by turning the focus ring.
6. Set the lens to the widest angle by turning the zoom ring.
7. Loosen the flange back lock screw,and turn the flange back adjusting ring to bring the object into focus.
8. Repeat steps 4 to 7 a few times until the object is brought into focus at both the widest angle and telephoto ends.
9. Tighten the flange back lock screw.

3-2. IRIS GAIN ADJUSTMENT

An iris gain adjusting trimmer is located on the front of the lens drive unit. The iris gain is set at middle of range at the factory. However, if you wish to change the iris gain, adjust the trimmer through the procedure described below.





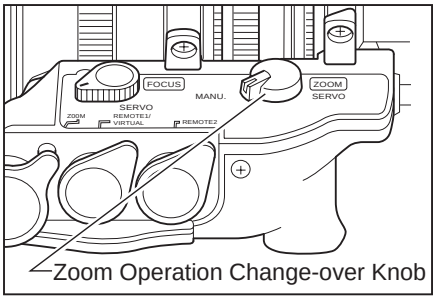
1. Pull up the rubber cap on the iris gain adjusting trimmer.
2. Set the iris operation mode change-over switch to the “A” position.
3. Turn the iris gain adjusting trimmer, using a small screwdriver to set the level as desired.
   To determine the maximum gain, set the trimmer at a level where no hunting occurs.
4. Close the rubber cap after adjustment completes.

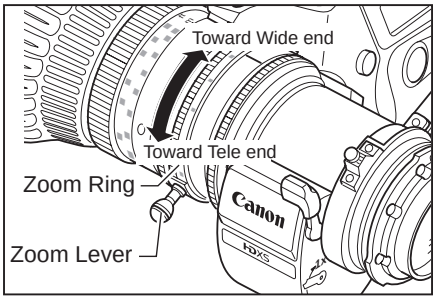
This adjustment can be performed on the information display.Refer to the Information Display Manual.

4 OPERATION

4-1. ZOOM OPERATION

4-1-1. Manual Zoom Operation





1 Set the zoom operation change-over knob at the bottom of the lens drive unit to MANU. position.

2 Turn the zoom ring (or zoom lever) to perform zoom operation.

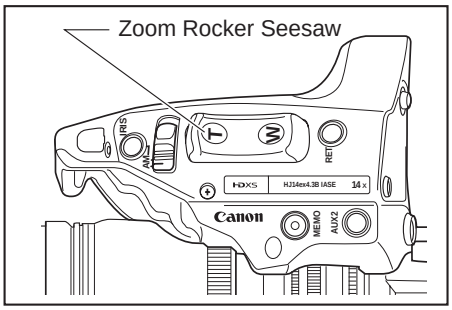
⚠ CAUTION

The zoom operation change-over knob must be set to the “MANU.” position before performing manual zoom operations.

The lens may be damaged if manual zoom operations are forcibly performed with the knob at the “SERVO” position.

4-1-2. Servo Zoom Operation

Zoom operation can be performed by driving the built-in motor in the lens.

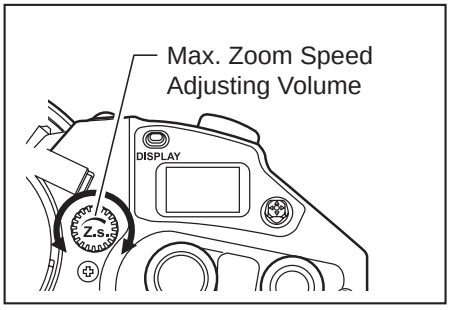


1 Set the zoom operation change-over knob to SERVO position.

2 Pressed the zoom rocker seesaw to perform zoom operation. Zoom speed changes by the depth of the switch being pressed. The deeper the switch is pressed the faster the zoom speed.

4-1-3. Maximum Zoom Speed Adjustment

The maximum speed of zoom when the zoom rocker seesaw is pressed can be adjusted with the adjusting volume.

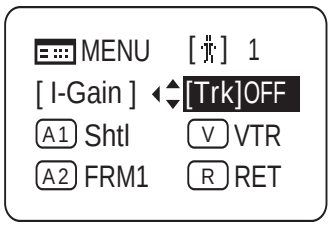


This adjustment can be performed on the information display. Refer to the Information Display Manual.

4-1-4. Zoom Track Function (only for servo zoom)

The zoom control range (zoom track) position can be set as desired to set the virtual zoom limit in the Tele end and Wide end. To use the zoom track function, the function should be enabled in advance.

A：Setting “ON” or “OFF” on the information display



1 Press the DISPLAY switch to turn on the display.

2 Select [Trk] using the control key, and then press the Set key. [Trk] and the last setting now blink on the display. (see left figure)

3 Press the left or right key to select ON or OFF.

4 Press the Set key. This completes the setting.

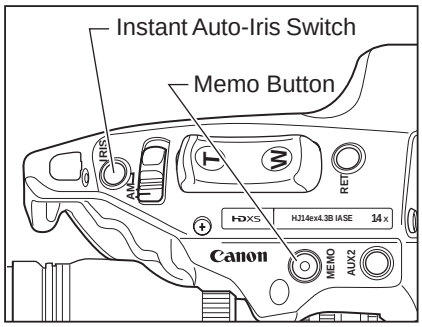
For details, refer to the Information Display Operation Manual.

B: Setting “ON” or “OFF” by operating the switches

	Selection method	Operation	How to ascertain the selection
To set the function to "ON"	Hold down the Memo botton and Instant auto-iris switch simultaneously for at least 3 seconds.	The zoom control range is fixed to the zoom range set last. (If there is no previous setting, it is set to the mechanism end point.)	Automatic zooming from current zoom position to the closer of the two set positions.
To set the function to "OFF"		The zoom range is set to the mechanical end.	Automatic zooming from current zoom position to the closer of the two mechanical ends.

Setting the Zoom Track Positions

The first step which must be taken if the zoom track position is to be set is to set the zoom track function to ON.



1 Zoom to the zoom track position that you want to set.

2 Keeping this zoom position, press the Instant Auto-Iris switch while holding down the Memo button. If the zoom position is at the Tele end, the position is stored as the zoom track position for the Tele limit. If position is at the Wide end, it is stored as the Wide limit.

3 Repeat steps 1 and 2 to set both Tele and Wide limits. It is possible to set only one end. To change the setting, perform steps 1 to 3. (The position set last overwrites the setting in the memory.)

NOTE

1) If the zoom track position is to be set again, the zoom position cannot move beyond the end point setting toward the mechanical end by performing servo zoom operations. To move the zoom, take one of the steps below.
   - Set the zoom track function to OFF.
   - Proceed with the zooming operation at the setting established by operating the zoom rocker seesaw.
   - Perform the zooming operation manually.
2) Although up to two zoom track positions (Tele end and Wide end) can be set, two positions cannot be set that are on the same side of the center position of the zoom range of this lens. (In this case, the setting that was made last is stored as the zoom track position of this side.)

4-1-5. F-Hold Function

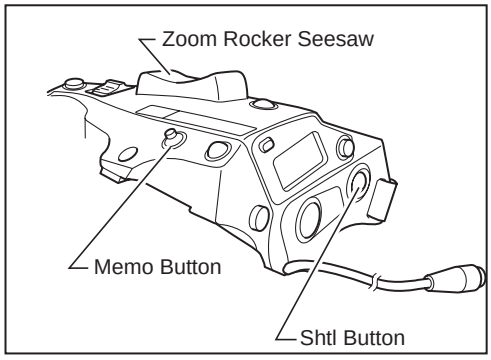
The F-Hold function is provided to enable zoom operation only within the range of focal length where the F drop does not occur. For details, refer to the Information Display Manual on the CD-ROM or the Pocket Guide.

4-1-6. Shuttle-Shot Function

This function allows you to switch between the current zoom position and the preset zoom position at the maximum speed.

Before using shuttle-shot function, the "Shtl" function must be assigned to VTR,RET,AUX1 or AUX2 switch.For details,refer to "4-6 Switch Operations".

Setting the shuttle memory position



Zoom to the position that you want to store. Keeping this position, press the Shtl switch while holding down the Memo switch.

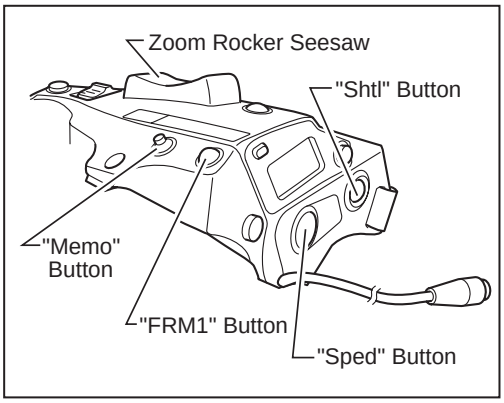
NOTE
The "position" you stored here is different from the one you set in "Framing Preset" mentioned later. The stored position set here is retained even after the power is turned off.

NOTE
The operation with the Shtl switch is given the priority over that with the zoom rocker seesaw. The operation with the zoom rocker seesaw is disabled while the Shtl switch is pressed.

4-1-7. Speed Preset

This function allows you to call the preset zoom speed any time you zoom. Assign the "Sped" function to VTR, RET, AUX1 or AUX2 switch. In this manual, operations are described on the assumption that "Sped" function was assigned to the VTR switch.

1. Storing the zoom speed and direction



Operate the zoom rocker seesaw to determine the zoom speed and direction (toward telephoto angle or widest angle) which you want to store, and press the memo button.

NOTE
The stored zoom speed is applied to the framing preset.

2. How to operate the speed preset function

When the “Sped” button is pressed, the zoom starts to move at the preset speed and to the determined direction (toward telephoto angle or widest angle) stored in section 1 until the zoom reaches its end.

3. How to cancel movement in Speed Preset

Movement in Speed Preset can be canceled by any of the following operations.

1）Press the “Sped” button again.→ Zoom movement stops.

2）Performing zoom operation with the zoom rocker seasaw / the “Shtl” button / the “FRM1” button.

4-1-8. Framing Preset

There are two framing preset types based on how the settings are combined.

［Zoom］

This enables a predetermined picture angle and movement speed (zoom speed) to be reproduced easily. “PRE” is the factory setting. If the “FAST” setting is used, it must be set on the information display.

［Zoom, Focus］“A” type only

This enables the movement speed (focus speed, zoom speed) to a predetermined focus and picture angle to be reproduced easily. It must be set on the information display.

Setting combinations

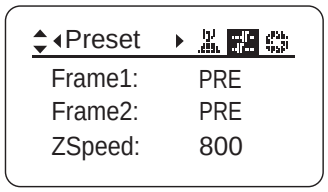
Frame preset	ON/OFF setting*1		Movement speed setting	
	Zoom	Focus	"PRE" (speed can be set)	"FAST" (maximum speed)
Zoom	ON	OFF	The zoom moves at the preset speed.	The zoom moves at the maximum speed.
Zoom, focus	ON	ON	The zoom and focus move at the preset speeds. *2	The zoom and focus move at the maximum speed.

*1 : For the procedure to be following for performing the settings on the information display, refer to the Information Display Manual.
*2 : The zoom and focus are controlled in such a way that they start and stop simultaneously.

NOTE

Up to two framing presets, Frame1 and Frame2, can be stored in the memory. Only Frame1 is described in the description given on the following pages. Frame1 is indicated as “FRM1”.

How to set the zoom speed to the framing memory position



On the information display, select “PRE” or “FAST” as the “FRM1” speed setting.

“PRE”----------For the preset speed setting（preset speed）

“FAST”---------For the maximum speed setting（fast speed）

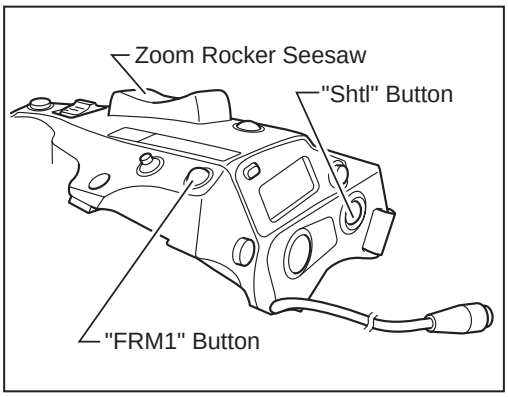
Framing Preset [Zoom]/[Zoom, Focus] Setting

The figure below is shown as an example. Actual state of the switch may look different if the function is allocated to the different switch.

1）Shtl function--------Assigned to the AUX1 switch by factory default.

2）FRM1 function-----Assigned to the AUX2 switch by factory default.

1. Setting the framing memory position



Zoom (and focus) to the position that you want to store, while holding this zoom (and zoom focus) position, press the “FRM1” button while holding down the Memo button.

NOTE
This framing memory position is different from the shuttle memory position (Refer to “4-1-6. Suttle-Shot Function”).The stored zoom position remains in the memory, even after the power is turned off.

2. Moving to the framing memory position

Once the ″FRM1″ button is pressed, the zoom starts to move toward the framing memory position at the preset speed. When the zoom reaches to the framing memory position, it stops and stays there.

3. Canceling the movement to the framing memory position or switching to other zoom operation.

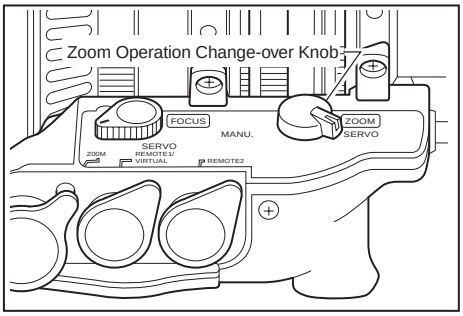
During movement to the framing memory position, the movement can be canceled and/or switched to other zoom operation by any of the following operations.

[Zoom Framing Preset]
- Pressing the “FRM1” button again.
- Zoom operation with the zoom rocker seesaw can immediately take over.
- Zoom operation with the “Shtl” button can immediately take over.

[Zoom, Focus Framing Preset]
- While is RET switch is held down, the on-air picture (returned picture) can be seen in the viewfinder.

4-1-9 Clutchless Zoom (“-C” / “-C A”LENSES)

The ″-C″ and ″-C A″ lenses clutchless incorporate a clutchless zoom mechanism.
Owing to the clutchless zoom mechanism, you are no longer required to operate the clutch when switching between the servo zoom and manual zoom. This mechanism allows you to use a fast manual zoom technique in the SERVO mode or a slow steady servo zoom technique in the MANUAL mode.

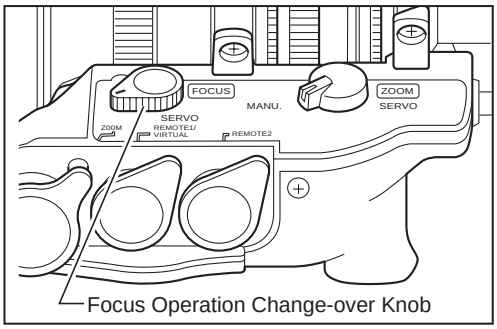


Set the zoom operation change-over knob to the SERVO position to activate the clutchless zoom mechanism.

Zoom operation change-over knob	Clutchless zoom mechanism	Operation
Servo	ON	Setting used when both servo and manual operations are needed Without operating a clutch, you can switch between the servo zoom and manual zoom.
Manu	OFF	Set to MANU when you want to use only the manual zoom.

4-2. FOCUS OPERATION

4-2-1. Manual Focus Operation

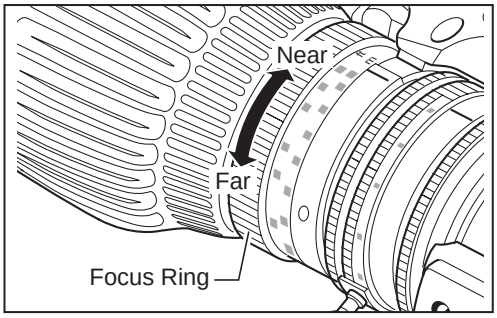


1 When A type lens is used, set the zoom operation change-over knob to MANU. position.

> ⚠ CAUTION
> When using the A type lens, the camera can be damaged if excessive force is used to try to turn the focus ring when the knob is left in the SERVO position.

2 Turn the focus ring to bring the near or far object into focus.

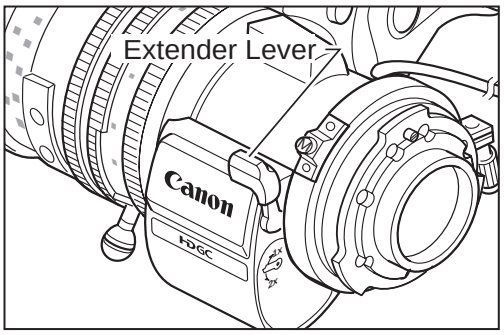
4-2-2. Servo Focus Operation



1 When A type lens is used, set the zoom operation change-over knob to SERVO position.

2 Mount the accessory such as focus demand. For the operation of accessories, refer to the attached document.

4-3. EXTENDER OPERATION



The lens with built-in extender has the built-in 2x extender.

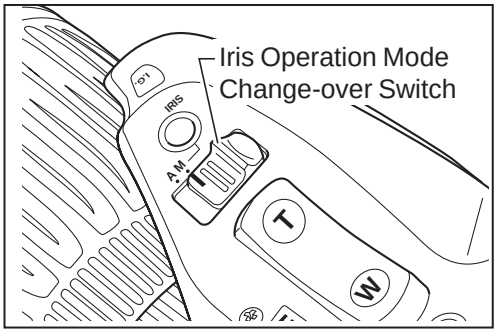
Use the extender lever to switch between 1x and 2x.

When the extender is used, note that the light quantity may decrease by the zoom ratio depending on the iris correction setting.

4-4. IRIS OPERATION

The iris operation mode can be switched between auto and manual with the iris operation mode change-over switch.

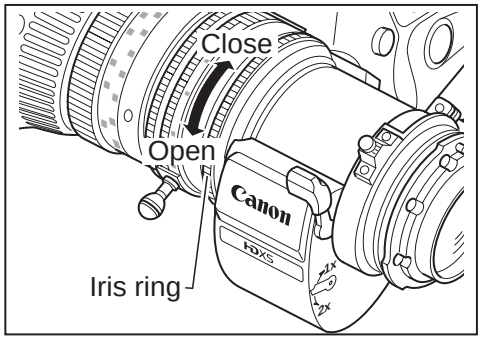
4-4-1. Automatic Iris Operation



Slide the iris operation mode change-over switch to the "A" position.

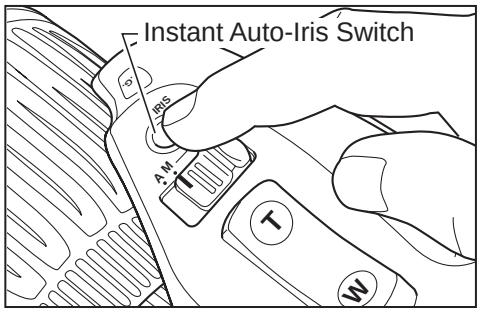
The iris operation is performed automatically by the instruction from the camera, to keep the video signal level constant.

4-4-2. Manual Iris Operation



Slide the iris operation mode change-over switch to the "M" position. The iris operation is performed by turning the iris ring on the lens body.

> ⚠ CAUTION
> The iris operation mode change-over switch must be set to the M position before performing manual iris operations. The lens may be damaged if manual iris operations are forcibly performed with the knob at the A position.

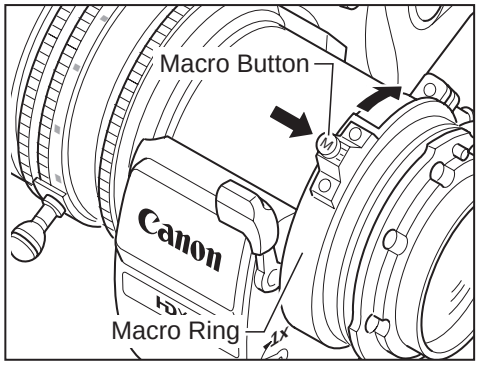


When the instant auto-iris switch is pressed during manual iris operation mode, the iris changes to automatic operation mode while the switch is held down.

This adjustment can be performed on the information display. Refer to the Information Display Manual.

4-5. MACRO OPERATION

In macro shooting, the object distance becomes shorter than the normal minimum object distance (M.O.D.). The minimum object distance by macro operation for this lens is 10mm at widest angle.



To operate the macro, press the macro button to unlock the macro ring. While holding it down, turn the macro ring at the rear of the lens clockwise as viewed from the camera side to allow macro shooting.

1 Set the lens to widest angle by manual or servo zoom operation.

2 Bring the object into focus by turning the macro ring

> NOTE
> Macro operation is also possible at any zoom position other than the widest angle, but the object distance increases.

Multi-point Focus Shooting

In macro shooting, when zooming to change the focal length, the focal point varies.
The multi-point focus shooting technique uses this characteristic. The focal point is shifted by the zoom operation. Follow the steps bellow :

1 Zoom in to a far object, and bring it into focus by normal focus operation.

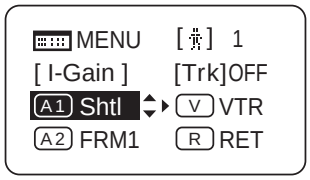
2 Zoom out to a near object and bring into focus by macro operation.

3 Zoom in to the far object again while not touching the macro button set by above step 2, and bring into focus again by normal focus operation.

4-6. SWITCH OPERATIONS

Functions can be assigned to the VTR, RET, AUX1, and AUX2 switches on the information display. VTR, RET, Shtl, FRM1 functions are assigned respectively by default.

The following steps explain how to assign the function to the switch. For further details, refer to the Information Display Operation Manual.

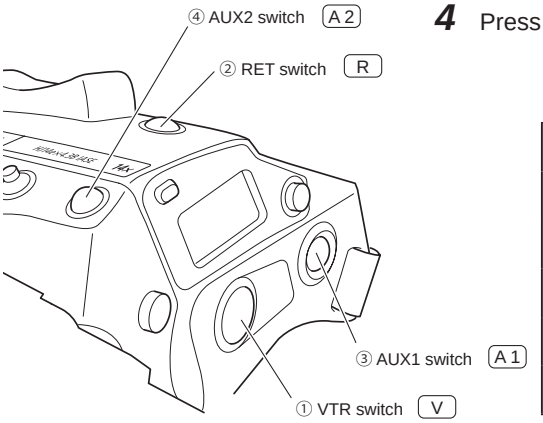


1 Press the DISPLAY switch to turn on the display.

2 After using the control key to select the name of the switch key to which the function is to be allocated, push the Set key. The name of the switch and the default or last setting now blink on the display.

3 Press the left or right key until the function to be changed to appears on the display.

4 Press the Set key. This completes the setting.



Switch	Default value	Functions						
		FRM1	FRM2	Sped	Shtl	VTR	RET	NON
① V	VTR	●	●	●	●	●	●	●
② R	RET	●	●	●	●	●	●	
③ A1	Shtl	●	●	●	●	●	●	●
④ A2	FRM1	●	●	●	●	●	●	

Switch name	Description
VTR	Stars/stops VTR operation.
RET	Hold down to view the main-line video on the view finder.
FRM1	Press to move to the stored zoom/focus position. One position can be stored/called per each switch.
FRM2	
Sped	Press to move in the stored zoom direction (toward Tele or Wide end) at the stored zoom speed.
Shtl	Press to move to the stored zoom position at the maximum speed. Release to return to the previous zoom position at the maximum speed.
NON	No function

5 LIST OF FUNCTIONS

The table below shows the functions that can be set from the drive unit. For setting instructions, refer to the Information Display Manual on the CD-ROM or the Pocket Guide.

Functions that can be set from the drive unit		
User Selection (User 0 to 9)		Analog Mode Settings (User A) Analog Mode Operations (User A)
Iris Gain		Auto Iris Gain Setting Remote Iris Gain Setting
Zoom Track Function		ON/OFF Selection
Function Assignment to Switch	AUX1	
	VTR	
	AUX2	
	RET	
	FRM1	Preset Speed Setting Zoom ON/OFF Selection Focus ON/OFF Selection (A type lens only)
	FRM2	
Description		Iris Torque Setting Zoom Curve Mode Setting Iris A/M Switch Setting Function Assignment to Seesaw Switch
MENU Screen		
User Screen		User Selection (User 0 to 9) Giving Names to the Users
Resetting		Resetting the Settings for One User Resetting the Settings for All the Users
Copying Data		Copying the Settings Established for One User to Another User Copying Data Between Lenses (1) Copying the Data Settings Established for One User into Another Lens (2) Copying the Data Settings Established for All the Users into Another Lens (3) When an Error Display has Appeared
Mode Settings		Lock Mode Settings (User 0 to 9) Analog Mode Settings (User A) Analog Mode Operations (User A) Escape Operation

Switch Screen	Assigning a Function to the AUX1 Switch Assigning a Function to the AUX2 Switch Assigning a Function to the VTR Switch Assigning a Function to the RET Switch Setting the Iris A/M Switch Assigning a Function to the Seesaw Switch	
Preset Screen	Frame Preset1	Setting the Preset Speed Setting the Zoom to ON or OFF Setting the Focus to ON or OFF
	Frame Preset2	
	Setting the Zoom Speed in the Preset Mode Setting the Zoom Start Characteristics for Preset Operations Setting the Zoom Stop Characteristics for Preset Operations	
Iris Screen	Iris Gain Setting (1) Auto Iris Gain Setting (2) Remote Iris Gain Setting Setting the Iris Torque Setting the Iris Correction to ON or OFF Setting the Iris Close Detection to ON or OFF	
Zoom Screen	Setting the Zoom Track to ON or OFF Setting F-Hold to ON or OFF Setting the Zoom Servo Start Characteristics Setting the Zoom Servo Stop Characteristics Setting the Zoom Mechanism End Stop Characteristics Setting the Curve Characteristics of the Seesaw Switch Setting the Analog Demand Curve Characteristics Setting the Maximum Value of the Zoom Speed Control Setting the Minimum Value of the Zoom Speed Control Setting the Servo Type from the Zoom Demand Setting the Zoom Speed Control to ON or OFF for the Zoom Demand Setting the Zoom Demand Specifications	
Focus Screen	Focus Demand Curve Characteristics (A type lenses only)	
Info Screen	Encoder Output Setting Initialize Operation Setting Setting the Camera Serial Communication to ON or OFF Adjustment of Camera Fol Voltage	
Fol. Screen	Lens Follow-Up Displays (Iris, Zoom and Focus)	

6 PRODUCT SPECIFICATIONS

16:9			HJ14ex4.3B	HJ17ex6.2B	HJ17ex7.6B	HJ18ex28B	HJ21ex7.5B	HJ22ex7.6B
Focal Length		1.0x	4.3-60mm	6.2-106mm	7.6-130mm	28-500mm	7.5-158mm	7.6-168mm
		2.0x	8.6-120mm	12.4-212mm	15.2-260mm	56-1000mm	15-316mm	15.2-336mm
Zoom Ratio			14 ×	17 ×	17 ×	18 ×	21 ×	22 ×
Maximum Relative Aperture		1.0x	1:1.8 (at 4.3-40.0mm) 1:2.7 (at 60mm)	1:1.8 (at 6.2-65.8mm) 1:2.9 (at 106mm)	1:1.8 (at 7.6-97.5mm) 1:2.4 (at 130mm)	1:2.8 (at 28-286mm) 1:4.9 (at 500mm)	1:1.9(at 7.5-116mm) 1:2.6 (at 158mm)	1:1.8 (at 7.6-114.1mm) 1:2.65 (at 168mm)
		2.0x	1:3.6 (at 8.6-80.0mm) 1:5.4 (at 120mm)	1:3.6 (at 12.4-131.6mm) 1:5.8 (at 212mm)	1:3.6 (at 15.2-195mm) 1:4.8 (at 260mm)	1:5.6 (at 56-572mm) 1:9.8 (at 1000mm)	1:3.8 (at 15-232mm) 1:5.2 (at 316mm)	1:3.6 (at 15.2-228.2mm) 1:5.3 (at 336mm)
Image Format			Dia. 11mm (9.6 × 5.4mm)					
Angular Field of View	Wide	1.0x	96.3º × 64.2º	75.5º × 47.1º	64.6º × 39.1º	19.6º × 11.1º	65.2º × 39.6º	64.6º × 39.1º
		2.0x	58.3º × 34.9º	42.3º × 24.6º	35.1º × 20.1º	9.9º × 5.6º	35.5º × 20.4º	35.1º × 20.1º
	Tele	1.0x	9.1º × 5.2º	5.2º × 2.9º	4.2º × 2.4º	1.1º × 0.6º	3.5º × 2.0º	3.27º × 1.84º
		2.0x	4.6º × 2.6º	2.6º × 1.5º	2.1º × 1.2º	0.6º × 0.3º	1.7º × 1.0º	1.64º × 0.92º
Minimum Object distance (M.O.D)			0.3m (Macro: 10mm from the lens vertex)	0.4m (Macro: 10mm from the lens vertex)	0.56m (Macro: 10mm from the lens vertex)	2.2m (Macro: 10mm from the lens vertex)	0.85m (Macro: 10mm from the lens vertex)	0.85m (Macro: 10mm from the lens vertex)
Object Dimensions at M.O.D	Wide	1.0x	76.4 cm × 43.0 cm	73.3 cm × 41.2 cm	65.4 cm × 36.8 cm	71.1 cm × 40.0 cm	120.4cm × 67.7 cm	100.6cm × 56.6 cm
		2.0x	38.2 cm × 21.5 cm	36.7 cm × 20.6 cm	32.7 cm × 18.4 cm	35.6 cm × 20.0 cm	60.2cm × 33.9cm	50.3 cm × 28.4 cm
	Tele	1.0x	5.2 cm × 2.9 cm	4.1 cm × 2.3 cm	4.0 cm × 2.3 cm	4.1 cm × 2.3 cm	5.6 cm × 3.2 cm	4.6 cm × 2.6 cm
		2.0x	2.6 cm × 1.5 cm	2.1 cm × 1.2 cm	2.0 cm × 1.2 cm	2.1 cm × 1.2 cm	2.8 cm × 1.6 cm	2.3 cm × 1.3 cm
Flange back			48mm (in air)					
Thread for filters			127mmP0.75 (Hood Unit Thread Size)	105mmP1.0(Hood Unit Thread Size))	82mmP0.75 (Front lens barrel Size)	127mmP0.75 (Hood Unit Thread Size)	127mmP0.75 (Hood Unit Thread Size)	94mmP1.0 (Front lens barrel Size) or105mmP1.0(Hood Unit Thread Size)
Zoom speed for full range			Max. 0.5s ± 0.2s	Max. 0.5s ± 0.2s	Max. 0.5s ± 0.2s	Max. 0.5s ± 0.2s	Max. 0.5s ± 0.2s	Max. 0.5s ± 0.2s
Focus speed for full range			1.3s ± 0.3s	1.5s ± 0.3s-	1.3s ± 0.3s	1.5s ± 0.3s	1.5s ± 0.3s	1.5s ± 0.3s
Iris			Control from camera					
Mount			B4 mount					
Power source			DC12V（DC10 ～ 17V）					
Current consumption (DC12V)	R type		Max. 320mA	Max. 320mA	Max. 320mA	Max. 320mA	Max. 320mA	Max. 320mA
	A type		Max. 500mA	Max. 500mA	Max. 500mA	Max. 500mA	Max. 500mA	Max. 500mA
Operating temperature			Temperature : -20˚C to + 45˚C Humidity : 5% to 95%RH (no condensation)					

Mass Without hood												
IRSE	Approx. 1.99kg	IRSE	Approx. 1.97kg	IRSE A	Approx. 1.6kg	IRSE A	Approx. 2.48kg	IRSE A	Approx. 2.61kg	IRSE	Approx. 1.81kg
IASE	Approx. 2.07kg			IASE A	Approx. 1.68kg	IASE A	Approx. 2.56kg	IASE A	Approx. 2.69kg	IASE	Approx. 1.89kg
IRSE-C	Approx. 2.03kg	IASE	Approx. 2.05kg	IRSE-CA	Approx. 1.64kg	IRSE-CA	Approx. 2.52kg	IRSE-CA	Approx. 2.65kg	IRSE-C	Approx. 1.85kg
IASE-C	Approx. 2.11kg			IASE-CA	Approx. 1.72kg	IASE-CA	Approx. 2.6kg	IASE-CA	Approx. 2.73kg	IASE-C	Approx. 1.93kg

LENS DESIGNATION

A Canon TV zoom lens model name is designated by image size, zoom ratio, focal length at widest angle, operation system (focus, zoom and iris), and other information as shown below.

① Image Size

HJ : for 2/3″ HDTV portable camera
DJ : for 2/3″ HDTV/SDTV day/night control portable camera
KJ : 2/3 type HDTV portable zoom lens
KH : 1/2 type HDTV portable zoom lens
KT : 1/3 type HDTV portable zoom lens

② Zoom Ratio

ex.）14ex : 14x zoom

③ Focal Length at Widest Angle

ex.）4.3 : 4.3 mm

④ Prism Compensation

B : Compensated for prism

①	②	③	④						
Ex.	HJ	14ex	4.3	B	I	A	S	E	- C
					⑤	⑥	⑦	⑧	⑨

⑤ Internal Extender

I : Built-in extender (s)
K : No Built-in extender
V : No Built-in extender, Built-in COU* unit
W : Built-in extender (s) and COU* unit
*COU：Crossover unit

⑥ Focus & Zoom Operation System

A ┌ Focus : Manual (Servo supported)
  └ Zoom : Servo/Manual

L ┌ Focus : Manual
  └ Zoom : Manual

R ┌ Focus : Manual
  └ Zoom : Servo/Manual

T ┌ Focus : Servo（Speed/Position）
  └ Zoom : Servo（Speed/Position）

⑦ Iris Operation System

L : Manual
S : Servo

⑧ Special Feature (1)

(none) : Analog servo drive
D : Digital servo drive
E : Digital servo drive with built-in encoder

⑨ Special Feature (2)

(none) : No special feature
(Hyphen "-" will be omitted.)
C : Clutch-less
V : Anti-vibration function included
A :Chromatic aberration correction (CAC) function supported*
*When used with the supported camera

MEMO

資料集
TECHNICAL INFORMATION
资料汇编

1. 外観図　EXTERNAL VIEW　外观图

(1) HJ14ex4.3B IASE
(2) HJ17ex6.2B IASE
(3) HJ17ex7.6B IASE A
(4) HJ18ex28B IASE A
(5) HJ21ex7.5B IASE A
(6) HJ22ex7.6B IASE A

R タイプおよびクラッチレスタイプはドライブユニット外観が一部異なります。

There are some differences in the external appearance of the drive unit for the R type and clutchless type.

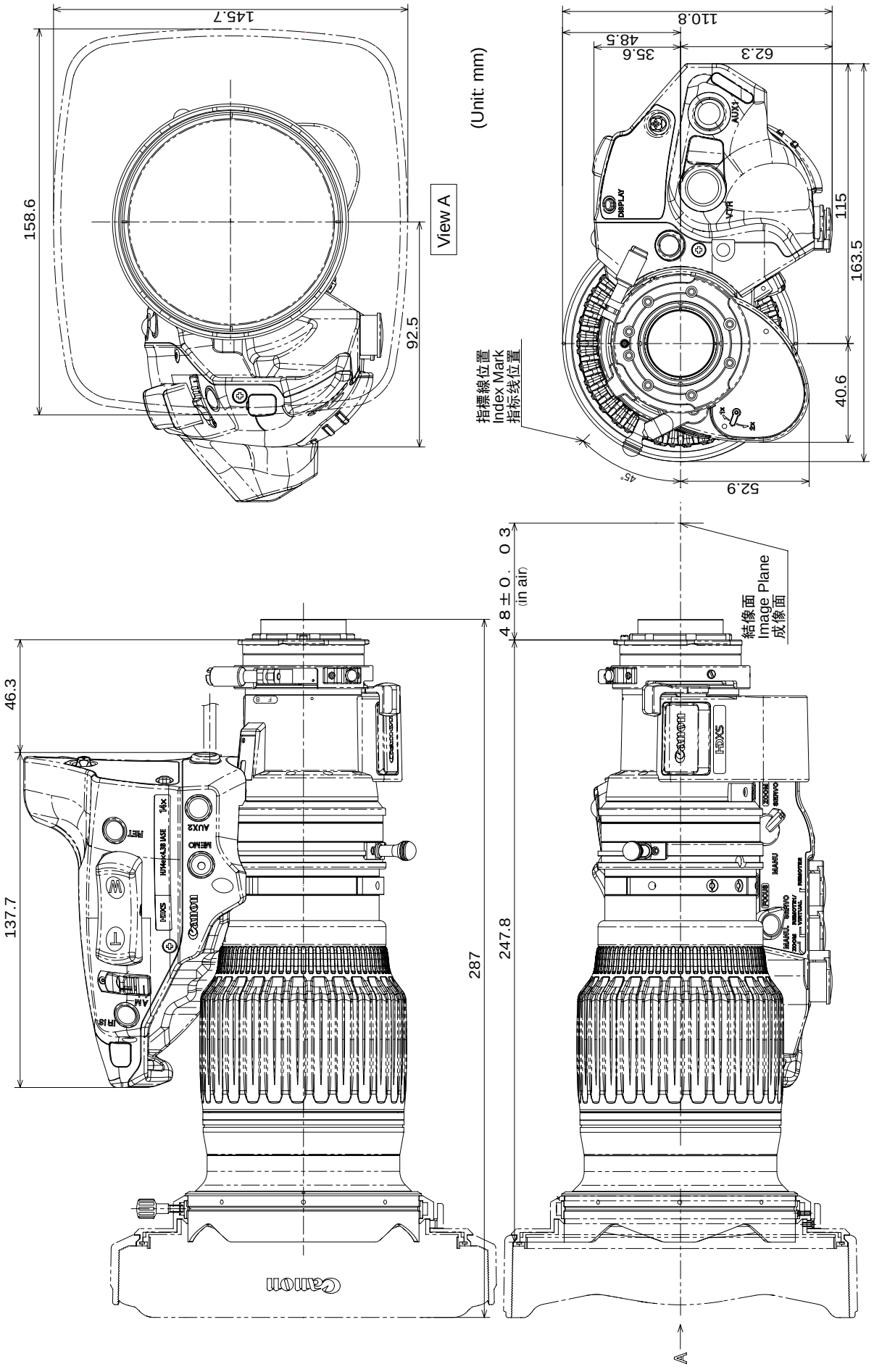
R 类型和无脚扣类型的驱动装置外观略有不同。

2. 総合結線図　GENERAL CIRCUIT DIAGRAM　总接线图

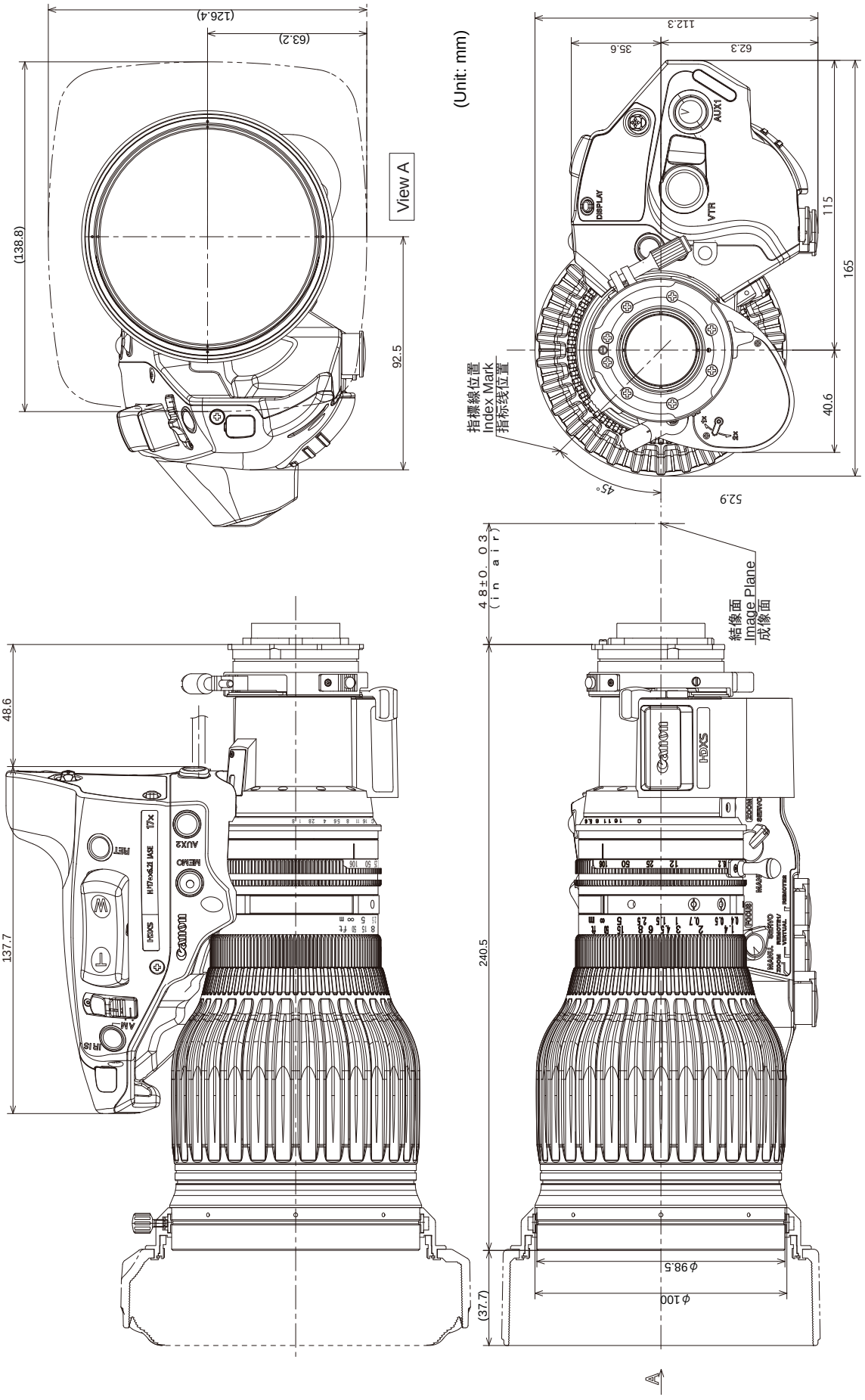
(1) IRSE / IRSE A
(2) IASE / IASE A
(3) IRSE-C / -C A
(4) IASE-C / -C A

1. 外観図 EXTERNAL VIEW 外观图

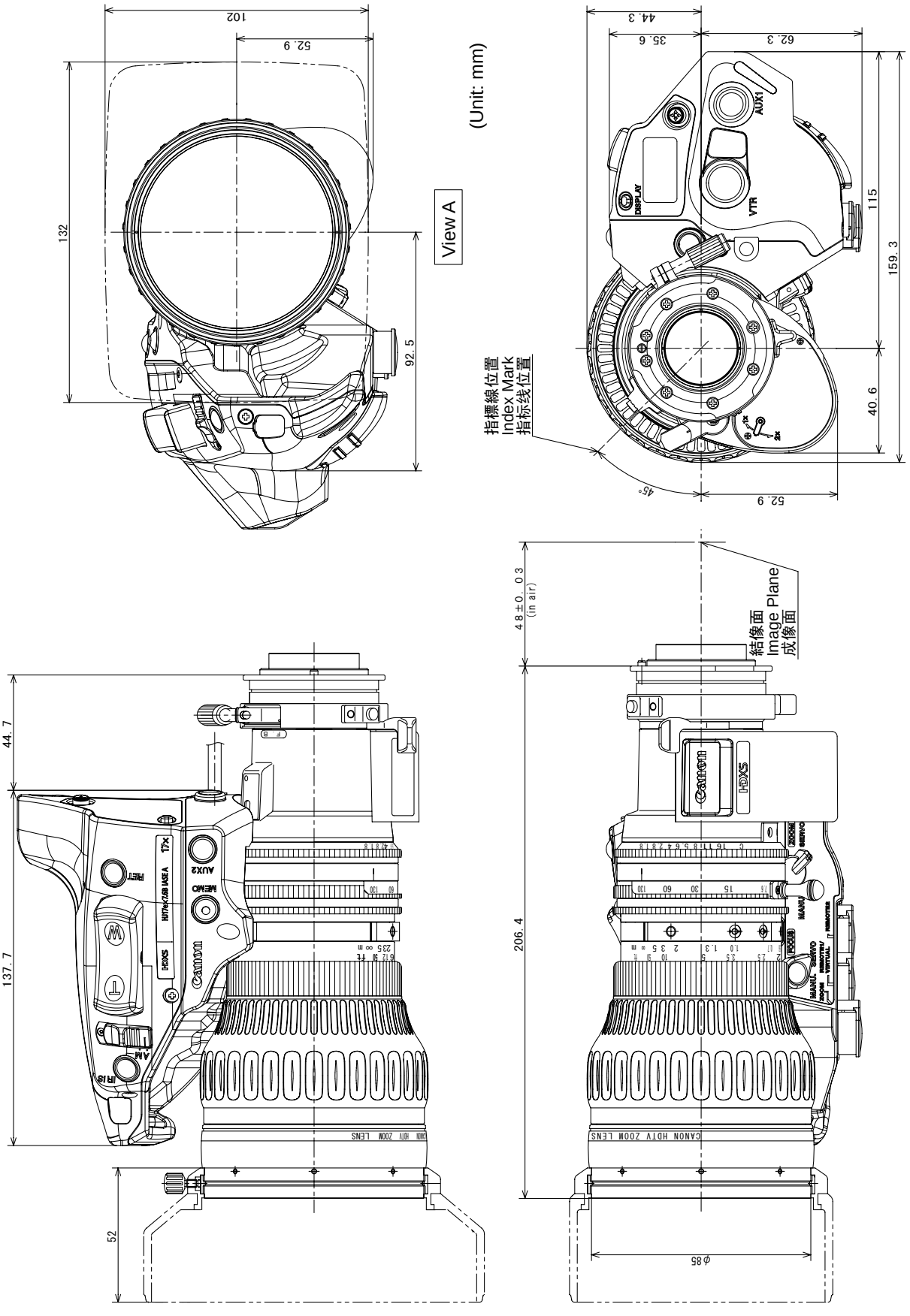
(1) HJ14ex4.3B IASE



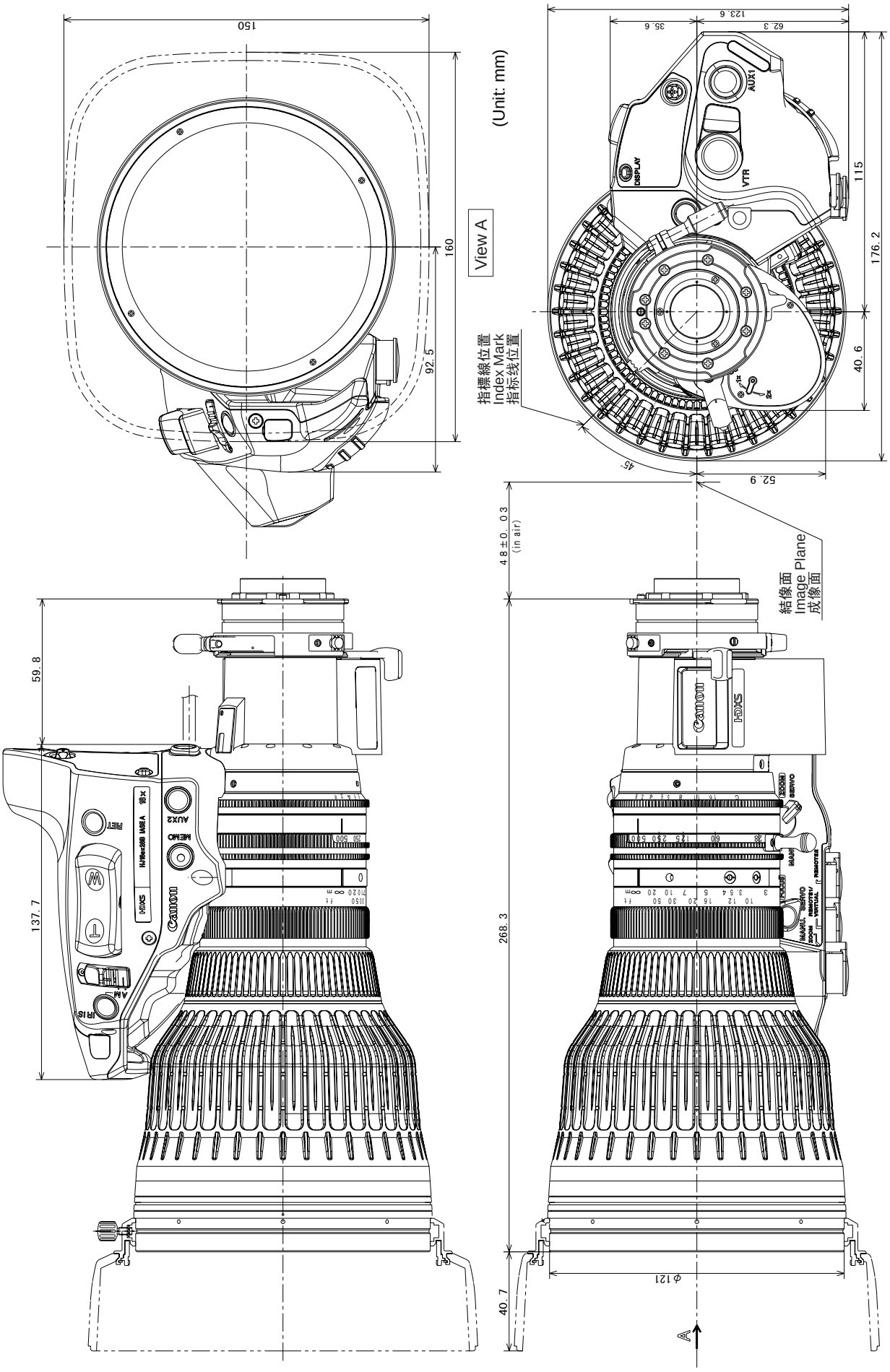
(2) HJ17ex6.2B IASE



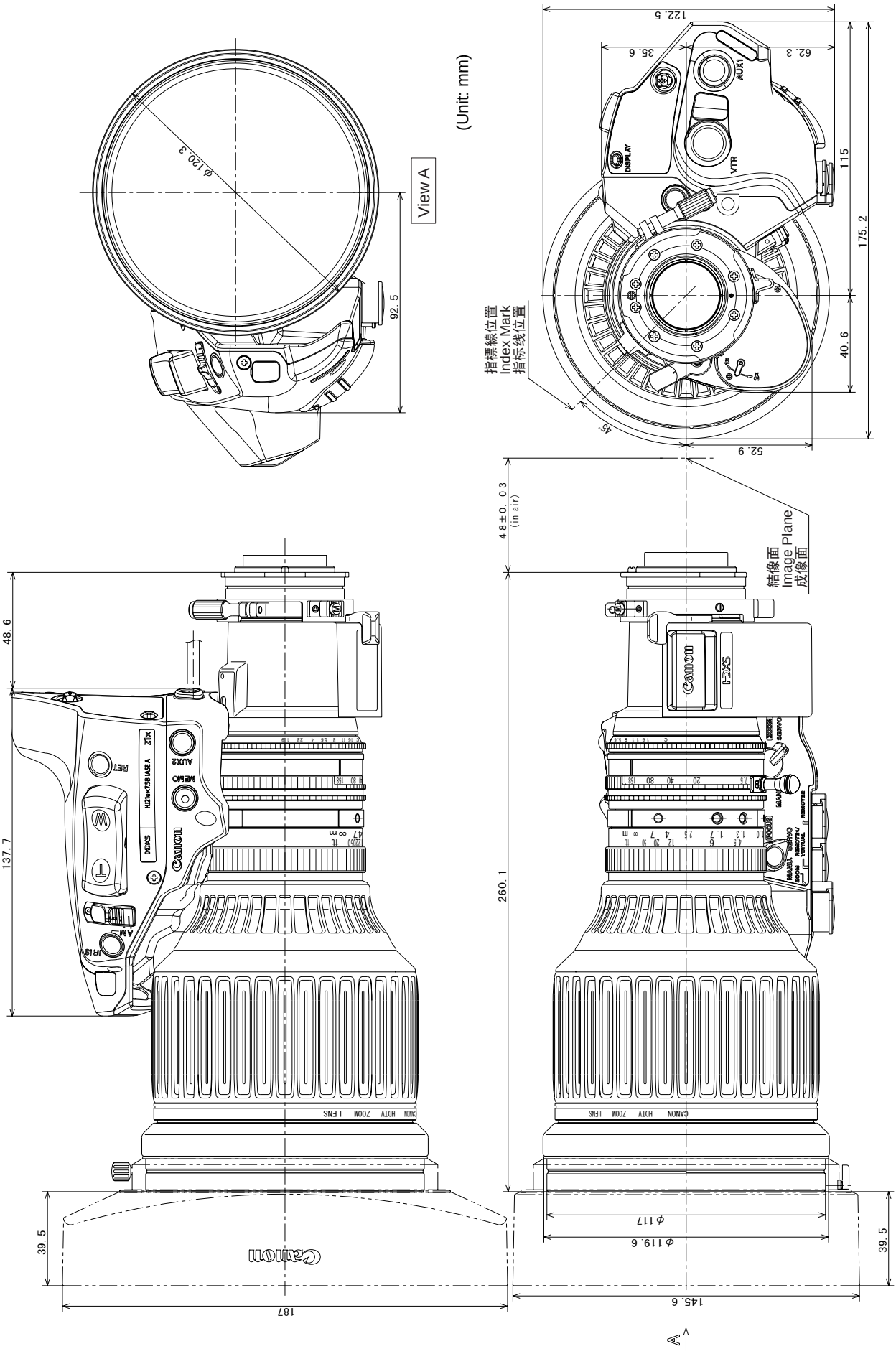
(3) HJ17ex7.6B IASE A



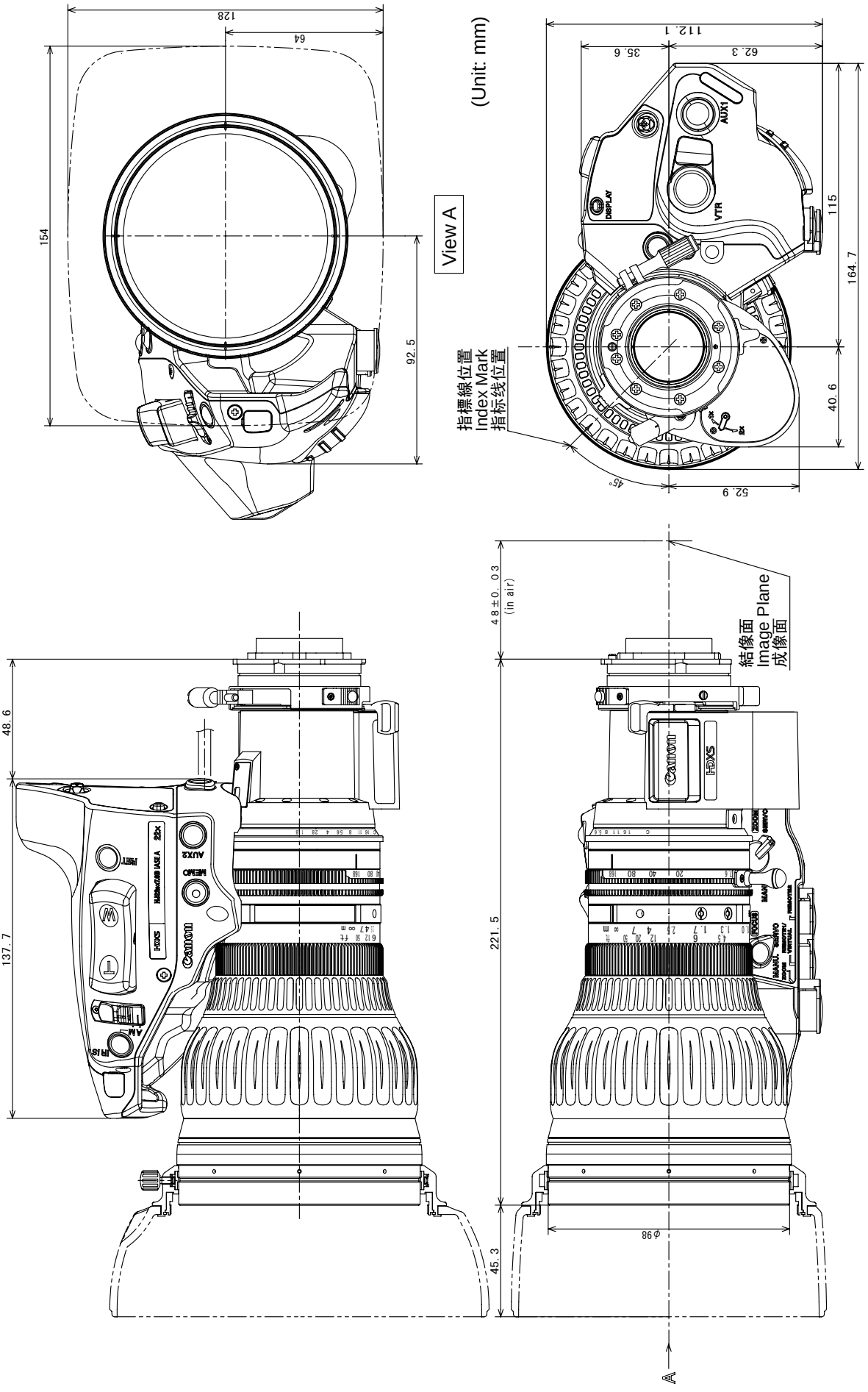
(4) HJ18ex28B IASE A



(5) HJ21ex7.5B IASE A

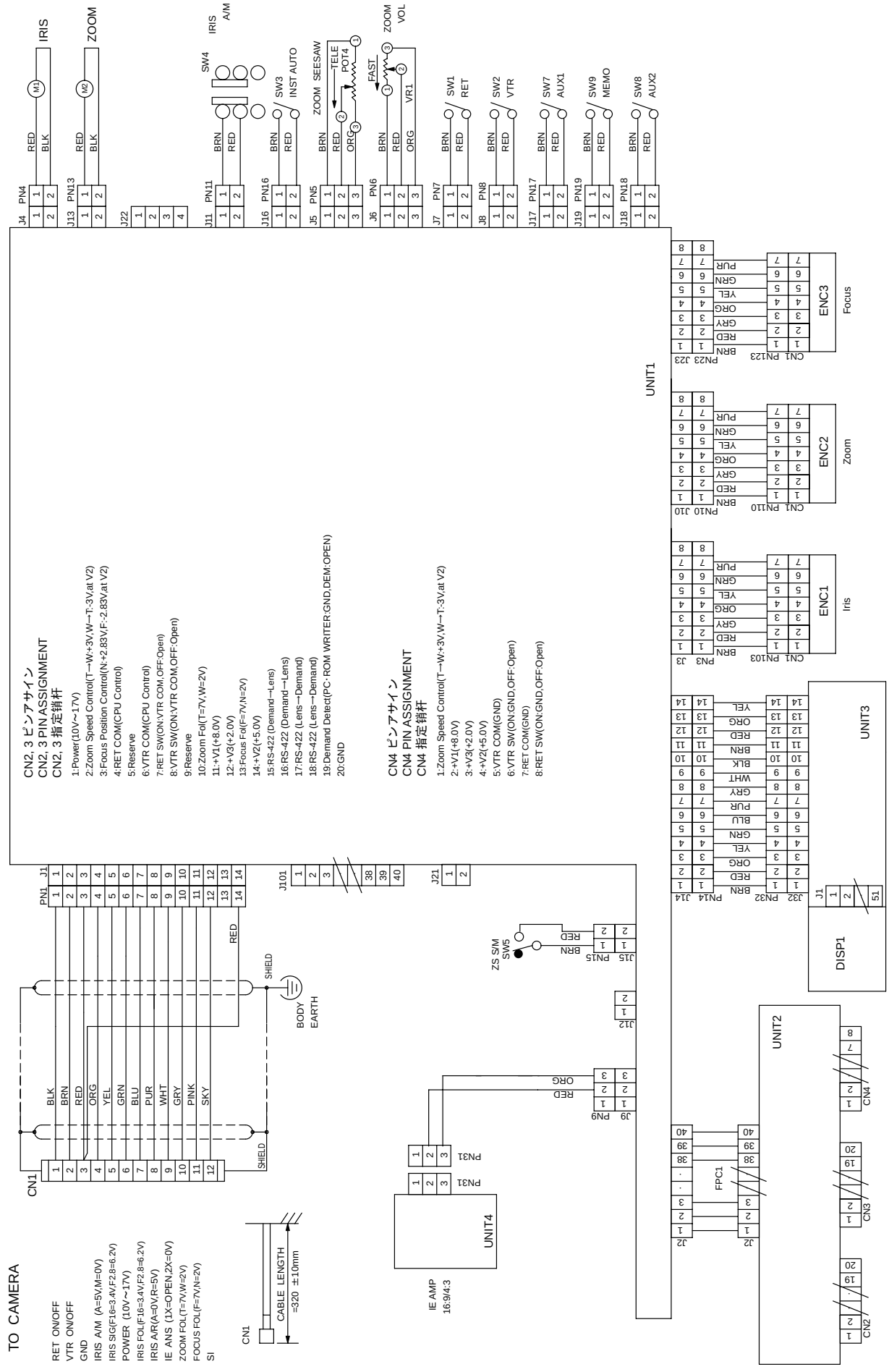


(6) HJ22ex7.6B IASE A

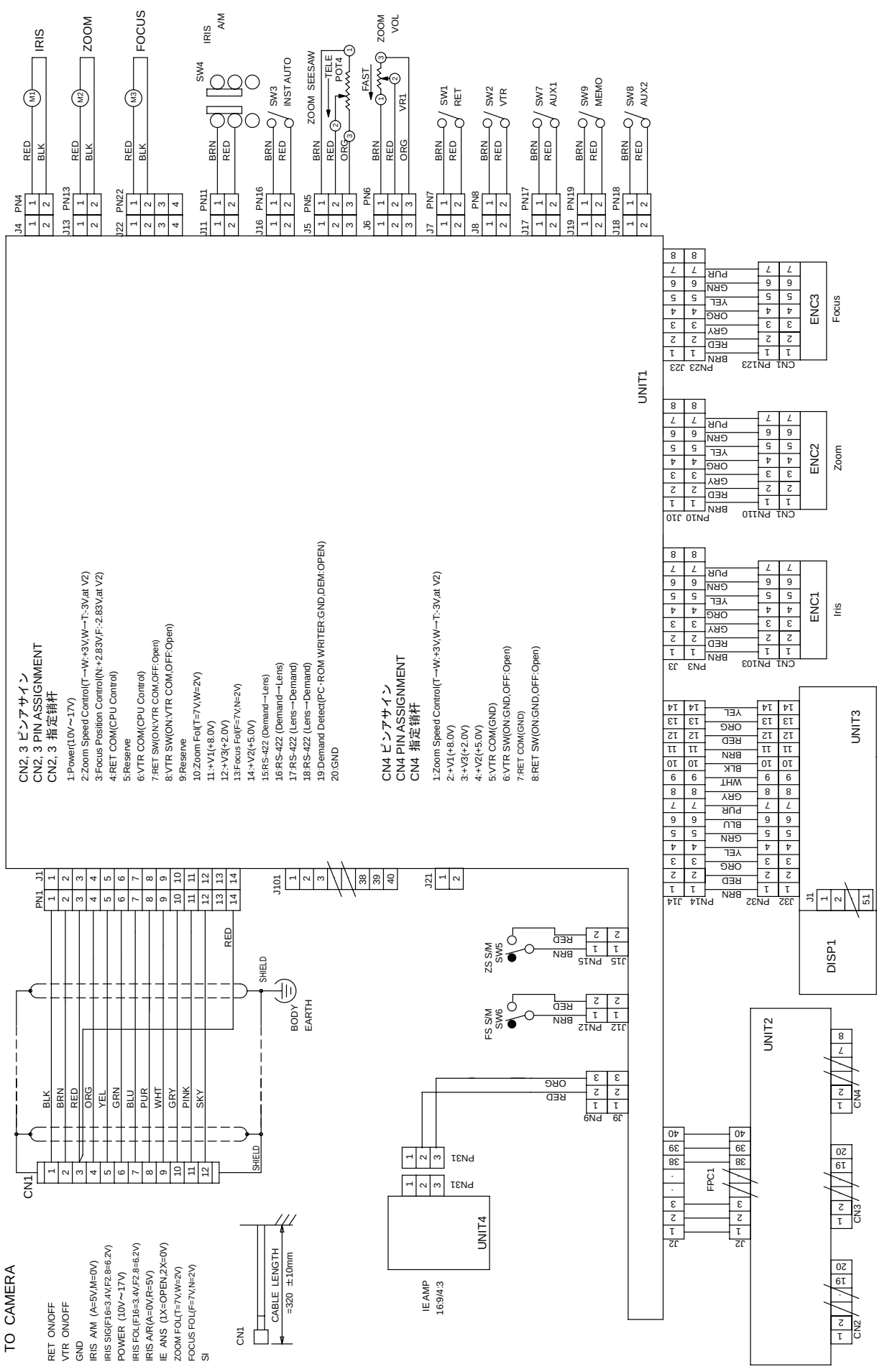


2. 総合結線図 GENERAL CIRCUIT DIAGRAM 总接线图

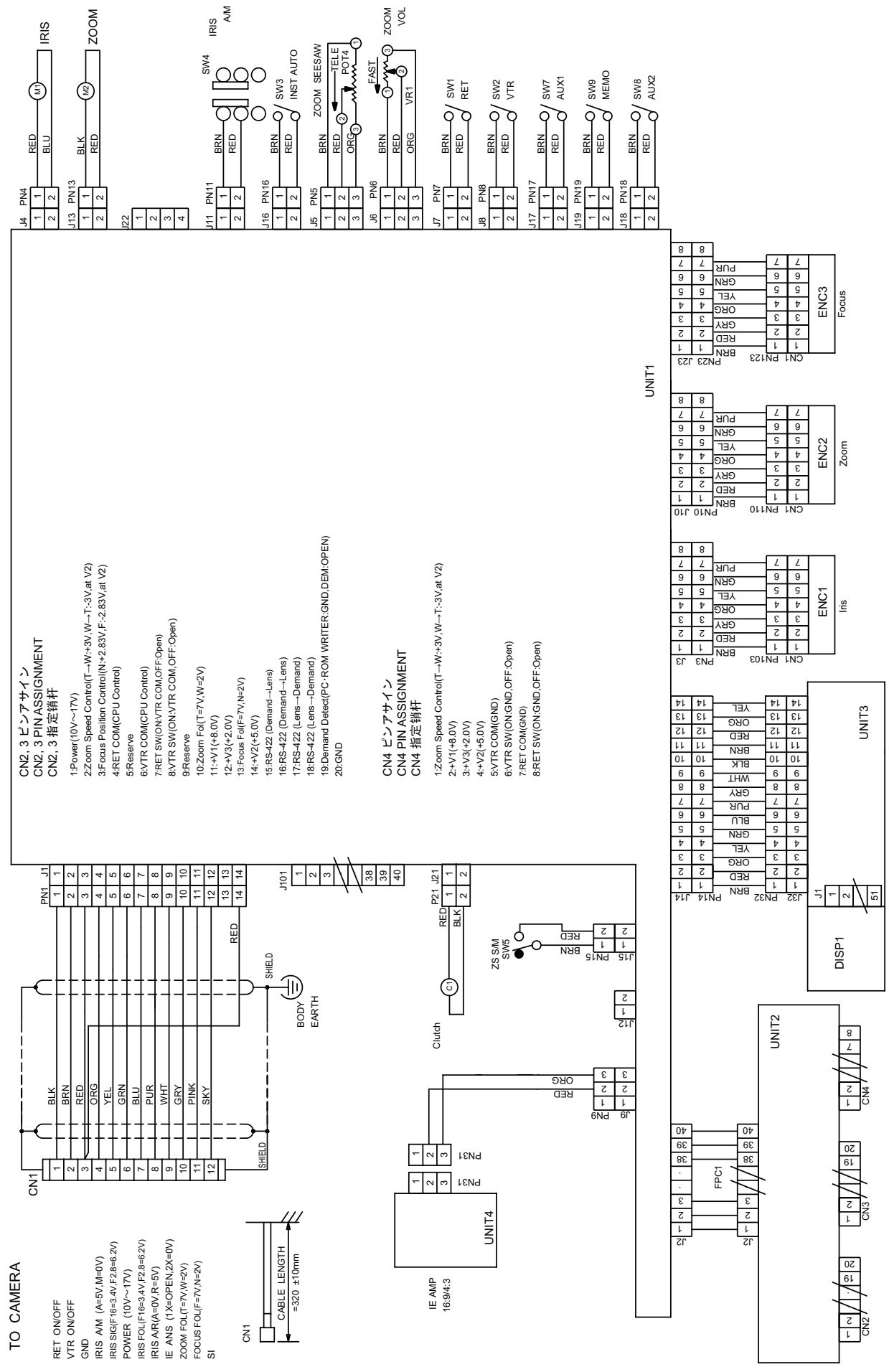
(1) IRSE / IRSE A



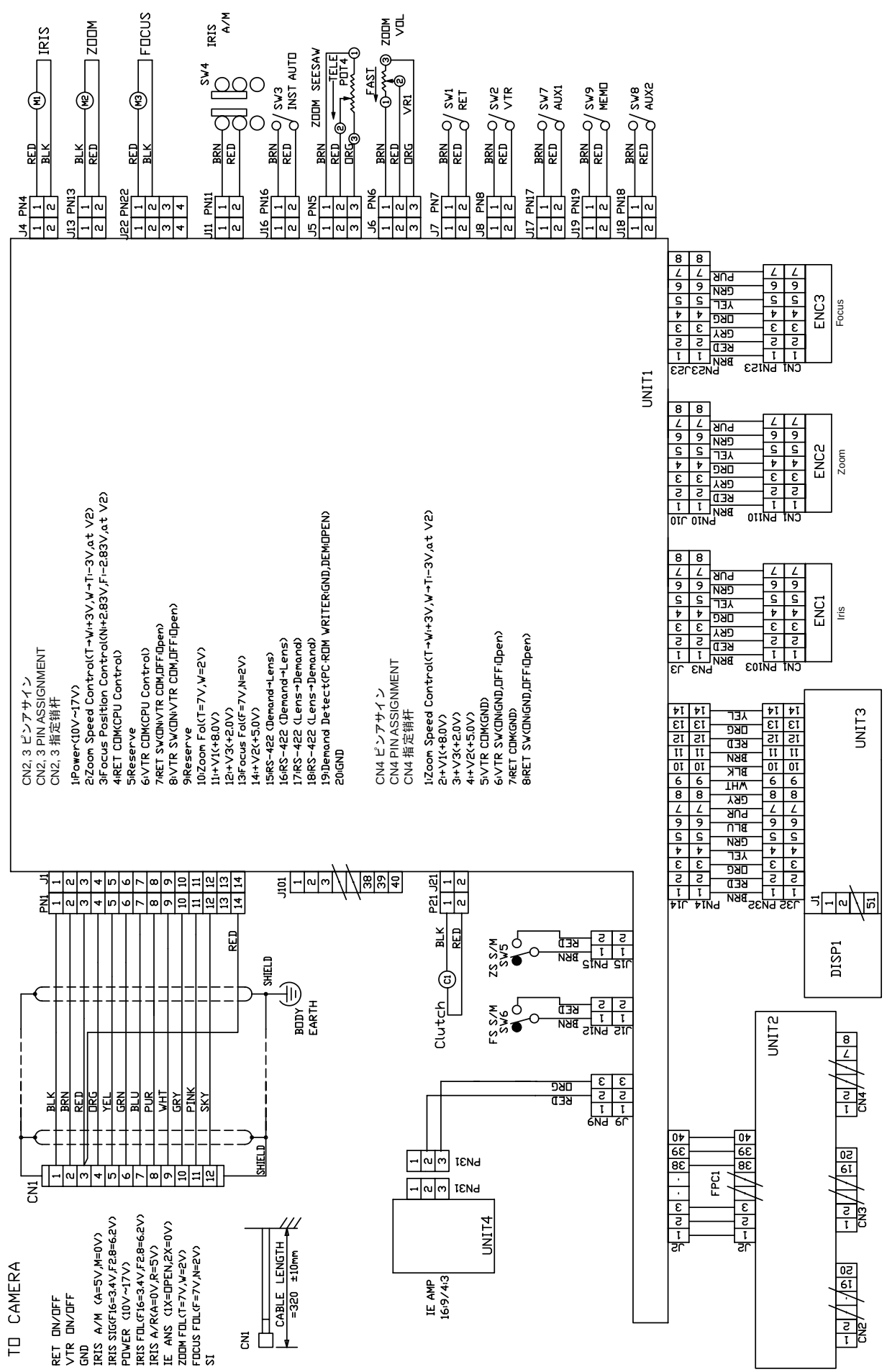
(2) IASE / IASE A


TO CAMERA
RET ON/OFF
VTR ON/OFF
GND
IRIS A/M (A=5V,M=0V)
IRIS SIG(F16=3.4V,F2.8=6.2V)
POWER (10V～17V)
IRIS FOL(F16=3.4V,F2.8=6.2V)
IRIS A/R(A=0V,R=5V)
IE ANS (1X=OPEN,2X=0V)
ZOOM FOL(T=7V,W=2V)
FOCUS FOL(F=7V,N=2V)
SI
CN1
CABLE LENGTH =320 ±10mm
IE AMP 16:9/4:3
UNIT4
UNIT1
UNIT2
UNIT3
DISP1
FPC1
CN2
CN3
CN4
IRIS
ZOOM
FOCUS
IRIS A/M
ZOOM VOL
ZOOM SEESAW
TELE
FAST
POT4
VR1
SW1 RET
SW2 VTR
SW3 INST AUTO
SW4
SW5 ZS S/M
SW6 FS S/M
SW7 AUX1
SW8 AUX2
SW9 MEMO
ENC1 Iris
ENC2 Zoom
ENC3 Focus
CN2, 3 ピンアサイン
CN2, 3 PIN ASSIGNMENT
CN2, 3 指定銷杆
1:Power(10V～17V)
2:Zoom Speed Control(T→W:+3V,W→T:-3V,at V2)
3:Focus Position Control(N:+2.83V,F:-2.83V,at V2)
4:RET COM(CPU Control)
5:Reserve
6:VTR COM(CPU Control)
7:RET SW(ON:VTR COM,OFF:Open)
8:VTR SW(ON:VTR COM,OFF:Open)
9:Reserve
10:Zoom Fol(T=7V,W=2V)
11:+V1(+8.0V)
12:+V3(+2.0V)
13:Focus Fol(F=7V,N=2V)
14:+V2(+5.0V)
15:RS-422 (Demand→Lens)
16:RS-422 (Demand→Lens)
17:RS-422 (Lens→Demand)
18:RS-422 (Lens→Demand)
19:Demand Detect(PC・ROM WRITER:GND,DEM:OPEN)
20:GND
CN4 ピンアサイン
CN4 PIN ASSIGNMENT
CN4 指定銷杆
1:Zoom Speed Control(T→W:+3V,W→T:-3V,at V2)
2:+V1(+8.0V)
3:+V3(+2.0V)
4:+V2(+5.0V)
5:VTR COM(GND)
6:VTR SW(ON:GND,OFF:Open)
7:RET COM(GND)
8:RET SW(ON:GND,OFF:Open)
BODY EARTH
SHIELD

(3) IRSE-C / -C A


CN2, 3 ピンアサイン
CN2, 3 PIN ASSIGNMENT
CN2, 3 指定銷杆
1:Power(10V~17V)
2:Zoom Speed Control(T→W:+3V,W→T:-3V,at V2)
3:Focus Position Contro(N:+2.83V,F:-2.83V,at V2)
4:RET COM(CPU Control)
5:Reserve
6:VTR COM(CPU Control)
7:RET SW(ON:VTR COM,OFF:Open)
8:VTR SW(ON:VTR COM,OFF:Open)
9:Reserve
10:Zoom Fol(T=7V,W=2V)
11:+V1(+8.0V)
12:+V3(+2.0V)
13:Focus Fol(F=7V,N=2V)
14:+V2(+5.0V)
15:RS-422 (Demand→Lens)
16:RS-422 (Demand→Lens)
17:RS-422 (Lens→Demand)
18:RS-422 (Lens→Demand)
19:Demand Detect(PC-ROM WRITER:GND,DEM:OPEN)
20:GND
CN4 ピンアサイン
CN4 PIN ASSIGNMENT
CN4 指定銷杆
1:Zoom Speed Control(T→W:+3V,W→T:-3V,at V2)
2:+V1(+8.0V)
3:+V3(+2.0V)
4:+V2(+5.0V)
5:VTR COM(GND)
6:VTR SW(ON:GND,OFF:Open)
7:RET COM(GND)
8:RET SW(ON:GND,OFF:Open)
UNIT1
UNIT2
UNIT3
UNIT4
DISP1
IRIS
ZOOM
IRIS A/M
INST AUTO
ZOOM SEESAW
TELE
POT4
FAST
ZOOM VOL
VR1
RET
VTR
AUX1
MEMO
AUX2
ENC1 Iris
ENC2 Zoom
ENC3 Focus
ZS S/M SW5
Clutch
BODY EARTH
CABLE LENGTH =320 ±10mm
IE AMP 16.9:4:3
FPC1
TO CAMERA
RET ON/OFF
VTR ON/OFF
GND
IRIS A/M (A=5V,M=0V)
IRIS SIG(F16=3.4V,F2.8=6.2V)
POWER (10V~17V)
IRIS FOL(F16=3.4V,F2.8=6.2V)
IRIS A/R(A=0V,R=5V)
IE ANS (1X=OPEN,2X=0V)
ZOOM FOL(T=7V,W=2V)
FOCUS FOL(F=7V,N=2V)
SI

(4) IASE-C / -C A


TO CAMERA
RET DN/OFF
VTR DN/OFF
GND
IRIS A/M (A=5V,M=0V)
IRIS SIG(F16=3.4V,F2.8=6.2V)
POWER (10V~17V)
IRIS FDL(F16=3.4V,F2.8=6.2V)
IRIS A/R(A=0V,R=5V)
IE ANS (1X=OPEN,2X=0V)
ZOOM FDL(T=7V,W=2V)
FOCUS FDL(F=7V,N=2V)
SI
CN1
CABLE LENGTH =320 ±10mm
IE AMP 16:9/4:3
UNIT4
UNIT1
UNIT2
UNIT3
DISP1
FPC1
CN2, 3 ピンアサイン
CN2, 3 PIN ASSIGNMENT
CN2, 3 指定銷杆
1:Power(10V~17V)
2:Zoom Speed Control(T→W:+3V,W→T:-3V,at V2)
3:Focus Position Control(N:+2.83V,F:-2.83V,at V2)
4:RET COM(CPU Control)
5:Reserve
6:VTR COM(CPU Control)
7:RET SW(ON:VTR COM,OFF:Open)
8:VTR SW(ON:VTR COM,OFF:Open)
9:Reserve
10:Zoom Fol(T=7V,W=2V)
11:+V1(+8.0V)
12:+V3(+2.0V)
13:Focus Fol(F=7V,N=2V)
14:+V2(+5.0V)
15:RS-422 (Demand→Lens)
16:RS-422 (Demand→Lens)
17:RS-422 (Lens→Demand)
18:RS-422 (Lens→Demand)
19:Demand Detect(PC:RDM WRITER:GND,DEM:OPEN)
20:GND
CN4 ピンアサイン
CN4 PIN ASSIGNMENT
CN4 指定銷杆
1:Zoom Speed Control(T→W:+3V,W→T:-3V,at V2)
2:+V1(+8.0V)
3:+V3(+2.0V)
4:+V2(+5.0V)
5:VTR COM(GND)
6:VTR SW(ON:GND,OFF:Open)
7:RET COM(GND)
8:RET SW(ON:GND,OFF:Open)
Clutch
FS S/M SW6
ZS S/M SW5
BODY EARTH
SHIELD
J4 PN4 IRIS
J13 PN13 ZOOM
J22 PN22 FOCUS
J11 PN11 IRIS A/M
J16 PN16 SW3 INST AUTO
J5 PN5 ZOOM SEESAW
J6 PN6 ZOOM VOL
J7 PN7 SW1 RET
J8 PN8 SW2 VTR
J17 PN17 SW7 AUX1
J19 PN19 SW9 MEMO
J18 PN18 SW8 AUX2
ENC1 Iris
ENC2 Zoom
ENC3 Focus

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